

ABSTRACT OF THE DISCLOSURE

A process for producing brightly photoluminescent silicon nanoparticles with an emission spanning the visible spectrum is disclosed. In one aspect, the process involves reacting a silicon precursor in the presence of a sheath gas with heat from a radiation beam under conditions effective to produce silicon nanoparticles and acid etching the silicon nanoparticles under conditions effective to produce photoluminescent silicon nanoparticles. Methods for stabilizing photoluminescence of photoluminescent silicon nanoparticles are also disclosed.